Urea Agar Base, Christensen

Urea Agar Base, Christensen is recommended for the detection of urease production, particularly by members of the genus *Proteus*.

**Composition**

<table>
<thead>
<tr>
<th>Ingredients</th>
<th>Gms / Litre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peptic digest of animal tissue</td>
<td>1.000</td>
</tr>
<tr>
<td>Dextrose</td>
<td>1.000</td>
</tr>
<tr>
<td>Sodium chloride</td>
<td>5.000</td>
</tr>
<tr>
<td>Monopotassium phosphate</td>
<td>2.000</td>
</tr>
<tr>
<td>Phenol red</td>
<td>0.012</td>
</tr>
<tr>
<td>Agar</td>
<td>15.000</td>
</tr>
<tr>
<td>Final pH (at 25°C)</td>
<td>6.8±0.2</td>
</tr>
</tbody>
</table>

**Formula adjusted, standardized to suit performance parameters**

**Directions**

Suspend 24.01 grams in 950 ml distilled water. Heat to boiling to dissolve the medium completely. Sterilize by autoclaving at 10 lbs pressure (115°C) for 20 minutes. Cool to 50°C and aseptically add 50 ml of sterile 40% Urea Solution (FD048) and mix well. Dispense into sterile tubes and allow to set in a slanting position. Do not overheat or reheat the medium as urea decomposes very easily.

**Principle And Interpretation**

Urea Agar was described by Christensen (1, 4) which detected urease activity by all rapidly urease-positive *Proteus* organisms and also by other members of *Enterobacteriaceae* (1) that exhibited a delayed urease reaction (2). This is accomplished by

a) adding glucose to the medium  

b) decreasing the peptone concentration, and  

c) decreasing the buffering system, as a less buffered medium detects even smaller amount of alkali (3).

ISO Committee has recommended Urea Agar Base, Christensen (M112I), with one phosphate, instead of two phosphates for detection of rapid urease activity (5).

Heavy inoculum of growth is inoculated on the surface of the slants. On incubation urea is utilized to form ammonia, which makes the medium alkaline, showing a pink-red colour by the change in the phenol red indicator. Prolonged incubation may cause alkaline reaction in the medium. Check using medium without urea as the negative control.

Peptic digest of animal tissues is the source of essential nutrients. Dextrose is the energy source. Sodium chloride maintains the osmotic equilibrium of the medium whereas phosphates serve to buffer the medium. Urea is hydrolyzed to liberate ammonia. Phenol red indicator detects the alkalinity generated by visible colour change from orange to pink.

**Quality Control**

**Appearance**
Light yellow to light pink homogeneous free flowing powder

**Gelling**
Firm, comparable with 1.5% Agar gel

**Colour and Clarity of prepared medium**
Yellowish orange coloured clear to slightly opalescent gel forms in tubes as slants

**Reaction**
Reaction of 2.4% w/v aqueous solution at 25°C. pH : 6.8±0.2

**pH**
6.60-7.00

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*Please refer disclaimer Overleaf.*
### Cultural Response

M112I: Cultural characteristics observed on addition of 40% Urea Solution (FD048) after an incubation at 35-37°C for 18-24 hours.

<table>
<thead>
<tr>
<th>Organism</th>
<th>Inoculum (CFU)</th>
<th>Growth</th>
<th>Urease</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Escherichia coli</em> ATCC 25922</td>
<td>50-100</td>
<td>luxuriant</td>
<td>negative reaction, no change</td>
</tr>
<tr>
<td><em>Enterobacter aerogenes</em> ATCC 13048</td>
<td>50-100</td>
<td>luxuriant</td>
<td>negative reaction, no change</td>
</tr>
<tr>
<td><em>Klebsiella pneumoniae</em> ATCC 13883</td>
<td>50-100</td>
<td>luxuriant</td>
<td>positive reaction, cerise colour</td>
</tr>
<tr>
<td><em>Proteus mirabilis</em> ATCC25933</td>
<td>50-100</td>
<td>luxuriant</td>
<td>positive reaction, cerise colour</td>
</tr>
<tr>
<td><em>Proteus vulgaris</em> ATCC 13315</td>
<td>50-100</td>
<td>luxuriant</td>
<td>positive reaction, cerise colour</td>
</tr>
<tr>
<td><em>Salmonella Typhimurium</em> ATCC 14028</td>
<td>50-100</td>
<td>luxuriant</td>
<td>negative reaction, no change</td>
</tr>
</tbody>
</table>

### Storage and Shelf Life

Store below 30°C in tightly closed container and the prepared medium at 2 - 8°C. Use before expiry date on the label.

### Reference


Revision : 1 / 2011

Disclaimer:

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